

V. REMARKS

Entry of the Amendment is proper under 37 C.F.R. §1.116 because the Amendment: a) places the application in condition for allowance for the reasons discussed herein; b) does not raise any new issue requiring further search and/or consideration because the Amendment amplifies issues previously discussed throughout prosecution; and c) places the application in better form for appeal, should an Appeal be necessary. The Amendment is necessary and was not earlier presented because it is made in response to arguments raised in the final rejection. The amendments to the subject claims do not incorporate any new subject matter into the claims. Thus, entry of the Amendment is respectfully requested.

Claims 1-14 are rejected under 35 USC 102 (b) as being anticipated by Bartlett et al. (U.S. Patent No. 5,375,424). The rejection is respectfully traversed.

Bartlett teaches a cryopump that includes at least first and second stages in a cryopump chamber, a second stage heating element, a warm purge gas valve, a roughing valve and an electronic controller. The at least first and second stages in a cryopump chamber are cooled by a cryogenic refrigerator with an adsorbent on the second colder stage. The second stage heating element heats the second stage. The warm purge gas valve applies purge gas to the cryopump chamber. The roughing valve couples the cryopump chamber to a roughing pump. The electronic controller controls the heating element, purge gas valve and roughing valve. The controller is programmed to control a partial regeneration process while continuing operation of the cryogenic refrigerator by heating the second stage of the cryopump; cycling between application of purge gas to the cryopump and opening of a roughing valve from the cryopump until the cryopump is sufficiently empty of gases condensed and adsorbed on the second stage; maintaining the roughing pump open to reduce pressure of the cryopump while continuing heating of the second stage; stopping heating of the second stage and continuing rough pumping of the cryopump with the roughing valve open to further reduce pressure of the cryopump; closing the roughing

valve at a base pressure level; and, cyclically opening and closing the roughing valve as the cryopump cools down to maintain the pressure of the cryopump near to the base pressure level.

Amended claim 1 now recites:

A water regeneration method for discharging ice condensed in a portion cooled by a cryogenic refrigerator installed in a case to an outside of the case, comprising:

a temperature increasing step for melting the ice into water at approximately atmospheric pressure and at a melting temperature of at least 273 K;

a vaporizing step for vaporizing water by performing a plurality of first roughing steps between the approximate atmospheric pressure and a first reduced pressure being less than the atmospheric pressure but higher than and yet close to a water-freezing pressure that causes the water to freeze;

a water discharge step for discharging water by performing a plurality of second roughing steps between a second reduced pressure and the first reduced pressure, the second reduced pressure being less than the atmospheric pressure and greater than the first reduced pressure; and

a water vapor discharging step for discharging water vapor by performing a plurality of third roughing steps between a third reduced pressure and a fourth reduced pressure, the third and fourth reduced pressures being less than the first reduced pressure and the third reduced pressure being greater than the fourth reduced pressure,

wherein each one of the vaporizing step, the water discharge step and the water vapor discharging step occurs at the melting temperature of at least 273 K.

It is respectfully submitted that the rejection is improper because the applied art fails to teach each and every element of claim 1, as amended. Specifically, it is respectfully submitted that the applied art fails to teach that each one of the vaporizing step, the water discharge step and the water vapor discharging step

occurs at the melting temperature of at least 273 K. By contrast, the applied art teaches that the first stage is warmed to and held at about 110 K (column 5, line 12) and the second stage temperature set point is set at a level between 175 K and 200 K (column 5, lines 16-18). Thus, it is respectfully submitted that claim 1 is allowable over the applied art.

Amended claim 10 now recites:

A water regeneration apparatus for discharging ice condensed in a portion cooled by a cryogenic refrigerator installed in a case to an outside of the case, comprising:

temperature increasing means for melting the ice into water at approximately atmospheric pressure and at a melting temperature of at least 273 K;

vaporizing means for vaporizing the water by performing a plurality of first roughing steps between the approximate atmospheric pressure and a first reduced pressure being less than the atmospheric pressure but higher than and yet close to a water-freezing pressure that causes the water to freeze;

water discharge means for discharging water to the outside of the case by performing a plurality of second roughing steps between a second reduced pressure and the first reduced pressure, the second reduced pressure being less than the atmospheric pressure and greater than the first reduced pressure; and water vapor discharging means for discharging water vapor by performing a plurality of third roughing steps between a third reduced pressure and a fourth reduced pressure, the third and fourth reduced pressures being less than the first reduced pressure and the third reduced pressure being greater than the fourth reduced pressure,

wherein each one of the vaporizing step, the water discharge step and the water vapor discharging step occurs at the melting temperature of at least 273 K.

It is respectfully submitted that the rejection is improper because the applied art fails to teach each and every element of claim 10, as amended. Specifically, it is

respectfully submitted that the applied art fails to teach that each one of the vaporizing step, the water discharge step and the water vapor discharging step occurs at the melting temperature of at least 273 K. As mentioned above, by contrast, the applied art teaches that the first stage is warmed to and held at about 110 K (column 5, line 12) and the second stage temperature set point is set at a level between 175 K and 200 K (column 5, lines 16-18). Thus, it is respectfully submitted that claim 10 is allowable over the applied art.

Amended claim 14 now recites:

A water regeneration method for discharging ice condensed in a portion cooled by a cryogenic refrigerator installed in a case to an outside of the case, comprising:

a temperature increasing step for melting the ice into water at an approximate atmospheric pressure of approximately 100,000 Pa and at a melting temperature of at least 273 K;

after the temperature increasing step, a vaporizing step for vaporizing water by performing a plurality of first roughing steps between the approximate atmospheric pressure of approximately 100,000 Pa and a first reduced pressure of approximately 100 Pa being higher than and yet close to a water-freezing pressure that causes the water to freeze;

after the vaporizing step, a water discharge step for discharging water by performing a plurality of second roughing steps between a second reduced pressure of approximately 200 Pa and the first reduced pressure of approximately 100 Pa; and

after the water discharge step, a water vapor discharging step for discharging water vapor by performing a plurality of third roughing steps between a third reduced pressure of approximately 15 Pa and a fourth reduced pressure of approximately 10 Pa,

wherein each one of the vaporizing step, the water discharge step and the water vapor discharging step occurs at the melting temperature of at least 273 K.

It is respectfully submitted that the rejection is improper because the applied

art fails to teach each and every element of claim 14, as amended. Specifically, it is respectfully submitted that the applied art fails to teach that each one of the vaporizing step, the water discharge step and the water vapor discharging step occurs at the melting temperature of at least 273 K. As mentioned above, by contrast, the applied art teaches that the first stage is warmed to and held at about 110 K (column 5, line 12) and the second stage temperature set point is set at a level between 175 K and 200 K (column 5, lines 16-18). Thus, it is respectfully submitted that claim 14 is allowable over the applied art.

Support for these proposed amendments is specifically found in Figure 7.

Claims 2-9 depend from claim 1 and include all of the features of claim 1. Thus, it is respectfully submitted that the dependent claims are allowable at least for the reason claim 1 is allowable as well as for the features they recite.

Claims 11-13 depend from claim 10 and include all of the features of claim 10. Thus, it is respectfully submitted that the dependent claims are allowable at least for the reason claim 10 is allowable as well as for the features they recite.

Withdrawal of the rejection is respectfully requested.

It is respectfully submitted that the pending claims are believed to be in condition for allowance over the prior art of record. Therefore, this Amendment is believed to be a complete response to the outstanding Office Action. Further, Applicant asserts that there are also reasons other than those set forth above why the pending claims are patentable. Applicant hereby reserves the right to set forth further arguments and remarks supporting the patentability of their claims, including the separate patentability of the dependent claims not explicitly addressed herein, in future papers.

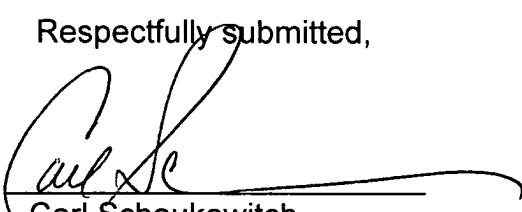
In view of the foregoing, reconsideration of the application and allowance of the pending claims are respectfully requested. Should the Examiner believe anything

further is desirable in order to place the application in even better condition for allowance, the Examiner is invited to contact Applicant's representative at the telephone number listed below.

Should additional fees be necessary in connection with the filing of this paper or if a Petition for Extension of Time is required for timely acceptance of the same, the Commissioner is hereby authorized to charge Deposit Account No. 18-0013 for any such fees and Applicant(s) hereby petition for such extension of time.

Respectfully submitted,

By:


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Enclosure(s): Amendment Transmittal

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